

CLAIMS

1. A human anti-human interleukin-6 (hereinafter, referred to as "IL-6") antibody that binds to human IL-6 and inhibits the biological activity thereof or a fragment
5 of said antibody.
2. The human anti-human IL-6 antibody or a fragment of said antibody of claim 1 which has a dissociation constant of 1.0×10^{-8} M or less.
3. A gene fragment coding for a VH chain of a human
10 anti-human IL-6 antibody that binds to human IL-6 and inhibits the biological activity thereof.
4. The gene fragment of claim 3 wherein complementarity determining regions (CDR1 to CDR3) of said VH chain have the following amino acid sequences:
15 CDR1: Lys Tyr Tyr Met Ala (SEQ ID NO: 5)
CDR2: Thr Ile Ser Asn Ser Gly Asp Ile Ile Asp Tyr Ala Asp
Ser Val Arg Gly (SEQ ID NO: 6)
CDR3: Glu Tyr Phe Phe Ser Phe Asp Val (SEQ ID NO: 7).
5. The gene fragment of claim 3 or 4 wherein said VH
20 chain has the amino acid sequence depicted in SEQ ID NO: 2.
6. The gene fragment of claim 4 or 5 wherein one or several amino acids are deleted, substituted or added in the amino acid sequence of said VH chain.
7. A gene fragment coding for a VL chain of a human
25 anti-human IL-6 antibody that binds to human IL-6 and

inhibits the biological activity thereof.

8. The gene fragment of claim 7 wherein complementarity determining regions (CDR1 to CDR3) of said VL chain have the following amino acid sequences:

5 CDR1: Arg Ala Ser Gln Asp Ile Arg Asn Trp Val Ala (SEQ ID NO: 8)

CDR2: Asp Gly Ser Ser Leu Gln Ser (SEQ ID NO: 9)

CDR3: Gln Gln Ser Asp Ser Thr Pro Ile Thr Phe (SEQ ID NO: 10).

10 9. The gene fragment of claim 7 or 8 wherein said VL chain has the amino acid sequence depicted in SEQ ID NO: 4.

10. The gene fragment of claim 8 or 9 wherein one or several amino acids are deleted, substituted or added in the amino acid sequence of said VL chain.

15 11. A gene fragment coding for a single chain Fv (hereinafter referred to as "scFv") of a human anti-human IL-6 antibody that binds to human IL-6 and inhibits the biological activity thereof, said gene fragment consisting of the gene fragment coding for the VH chain of any one of
20 claims 3 to 6 bound to the gene fragment coding for the VL chain of any one of claims 7 to 10.

12. A gene fragment coding for a human anti-human IL-6 antibody that binds to human IL-6 and inhibits the biological activity thereof, said gene fragment consisting
25 of the gene fragment coding for the VH chain of any one of

claims 3 to 6 bound to a human antibody CH chain gene and the gene fragment coding for the VL chain of any one of claims 7 to 10 bound to a human antibody CL chain gene.

13. A gene fragment coding for a human anti-human IL-6 antibody fragment that binds to human IL-6 and inhibits the biological activity thereof, said gene fragment consisting of the gene fragment coding for the VH chain of any one of claims 3 to 6 bound to a portion of a human antibody CH chain gene and the gene fragment coding for the VL chain of any one of claims 7 to 10 bound to a portion of a human antibody CL chain gene.

14. The gene fragment of claim 13 wherein said antibody fragment is selected from Fab, Fab' or F(ab')₂.

15. A gene fragment coding for a human anti-human IL-6 antibody fragment that binds to human IL-6 and inhibits the biological activity thereof, said gene fragment consisting of the gene fragment coding for the scFv of claim 11 bound either to a portion of a human antibody CH chain gene or to a portion of a human antibody CL chain gene.

16. A human anti-human IL-6 antibody that binds to human IL-6 and inhibits the biological activity thereof or a fragment of said antibody, which is expressed by the genetic recombination technique from an expression vector in which the gene fragment of any one of claims 3 to 15 is

incorporated.

17. The human anti-human IL-6 antibody or a fragment of said antibody of claim 16 which has a dissociation constant of 1.0×10^{-8} M or less.

5 18. An agent for inhibiting the binding between IL-6 and an IL-6 receptor comprising as an active ingredient the human anti-human IL-6 antibody or a fragment of said antibody of any one of claims 1 to 17.

10 19. A medicament for preventing or treating inflammation or immunopathy caused by the binding between human IL-6 and a human IL-6 receptor, said medicament utilizing the agent for inhibiting the binding of claim 18.